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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/911,430	07/25/2001	Norbert Breuer	R 38582	4686
7590	03/19/2004		EXAMINER	
Walter Ottesen Patent Attorney P.O. Box 4026 Gaithersburg, MD 20885-4026				CREPEAU, JONATHAN
		ART UNIT	PAPER NUMBER	1746

DATE MAILED: 03/19/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

## Office Action Summary

	Application No.	Applicant(s)
	09/911,430	BREUER, NORBERT
Examiner	Art Unit	
Jonathan S. Crepeau	1746	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) Responsive to communication(s) filed on 07 January 2004.
- 2a) This action is FINAL.                    2b) This action is non-final.
- 3) Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) Claim(s) 1-13 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) Claim(s) \_\_\_\_\_ is/are allowed.
- 6) Claim(s) 1-13 is/are rejected.
- 7) Claim(s) \_\_\_\_\_ is/are objected to.
- 8) Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) The specification is objected to by the Examiner.
- 10) The drawing(s) filed on \_\_\_\_\_ is/are: a) accepted or b) objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).  
a) All    b) Some \* c) None of:
  1. Certified copies of the priority documents have been received.
  2. Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)  | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                                   |   |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date _____ | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)             |
|  | 6) <input type="checkbox"/> Other: _____  |

## **DETAILED ACTION**

### ***Response to Amendment***

1. This Office action addresses claims 1-11 and newly added claims 12 and 13. All the claims are newly rejected under 35 USC §103, as necessitated by amendment. Accordingly, this action is made final.

### ***Claim Rejections - 35 USC § 112***

2. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.
3. Claims 4 and 5 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. Claim 4 recites that the second parameter is a “non-electrical” operating parameter of the fuel cell system. However, parent claim 1 requires the use of impedance spectroscopy, which involves only an alternating current and an alternating voltage, which are not “non-electrical” parameters of the fuel cell. Thus, claim 4 and claim 1 appear to recite mutually exclusive embodiments of the invention. Correction or clarification is required. Similarly, claim 5 requires that the evaluation unit is configured to compare a time-dependent change of the first parameter (i.e., AC current in the case of impedance spectroscopy) to a “desired” change in the parameter. However, impedance spectroscopy, as described in the instant specification, does not compare the measured current with another “desired” current

value (it uses it to calculate the impedance). Thus, the subject matter of claim 5 also appears to be mutually exclusive with that of claim 1.

***Claim Rejections - 35 USC § 102***

4. Claim 12 is rejected under 35 U.S.C. 102(b) as being anticipated by Meltser et al (U.S. Patent 5,763,113). The reference is directed to a fuel cell monitoring system (see abstract). The system may further comprise a fuel preparation unit (i.e., reformer) (see col. 5, line 55). The system comprises a measuring unit for measuring a voltage and a hydrogen concentration (see elements 44 and 36 in Fig. 1). The known changes in hydrogen concentration and voltage as a function of time are generated (see elements 58 and 86 in Fig. 2). An evaluation unit (104) evaluates the time-dependent change of each parameter in dependence on the time-dependent change of the other parameter (see Fig. 2).

Thus, the instant claim is anticipated.

5. Claims 1-9 and 11-13 are rejected under 35 U.S.C. 102(b) as being anticipated by WO 98/45890. Koschany (U.S. Patent 6,376,110) is taken as an English equivalent of WO ‘890 herein.

Regarding claims 1, 11, and 12, Koschany ‘110 is directed to a fuel cell monitoring system (see abstract). Regarding claims 1, 11, and 12, the system comprises a fuel preparation

unit (i.e., means for humidifying the anode gas) (see col. 5, line 36). Regarding claims 1, 2, 11, 12, and 13, the system comprises a measuring unit, a generator, and an evaluation unit that performs alternating current impedance spectroscopy (see col. 4, line 1 et seq.). The generator generates an AC voltage signal (i.e., a second operating parameter), and the measuring unit measures the corresponding AC current (i.e., a first operating parameter). The AC voltage and AC current are both time-dependent parameters within the meaning of the instant claims (see instant specification at page 11, line 6, and page 12, line 23 et seq.). Regarding claim 3, the AC voltage is an electrochemical parameter. Regarding claims 1, 10, and 11, an evaluation unit evaluates the change in AC current in dependence on the change in AC voltage (see col. 4, line 1 et seq.). Regarding claims 7 and 8, the system comprises a controller (30) which controls the fuel cell and fuel preparation unit (see col. 5, line 33). Regarding claim 6, a change in AC voltage affects the AC current response (see col. 4, line 1), and the evaluation unit further comprises a filtering device (see col. 4, line 44). Regarding claim 9, the evaluation unit also comprises a recording device for recording the values of the current and voltage at a plurality of frequencies and calculating the impedance therefrom (see col. 4, line 15). Regarding claim 11, the system comprises a load ( $R_L$ ) and means for connecting the fuel cell to the load (see Fig. 2). Thus, the instant claims are anticipated.

***Claim Rejections - 35 USC § 103***

6. Claim 10 is rejected under 35 U.S.C. 103(a) as being unpatentable over WO 98/45890 (Koschany) in view of Lee et al (U.S. Patent 6,365,289).

Koschany does not expressly teach that the fuel cell system is contained in a vehicle, as recited in claim 10.

In column 1, line 44, Lee et al. teach that “the so-called PEM (proton exchange membrane) electrolyte (also known as a solid polymer electrolyte) is an acid-type, and potentially has high-power and low-voltage, and thus are desirable for vehicle applications.”

Therefore, the invention as a whole would have been obvious to one of ordinary skill in the art at the time the invention was made because the artisan would be motivated to use the PEM fuel cell system of Koschany in a motor vehicle. As taught by Lee et al., PEM fuel cells are desirable for vehicular applications, and as such, the artisan would be motivated to use the PEM fuel cell system of Koschany in this capacity.

***Response to Arguments***

7. Applicant’s arguments filed January 7, 2004 have been fully considered but they are not persuasive. Applicants assert, regarding the Meltser et al. reference, that the “evaluation unit calculates the change of the hydrogen concentration per unit of time (step 58) and the change of voltage per unit of time (block 86). However, this evaluation unit does not generate any known change of a second operating parameter as a function of time.” However, it is submitted that the

“calculation” of a hydrogen concentration per unit time is in fact a “generation” of a known time-dependent change. Claim 12 merely requires “a generator for generating a known time-dependent change of said second operating parameter.” The claim does not specify how the known time-dependent change is generated. Applicant’s argument seems to be that it is set in a predefined manner by the user of the system. However, this configuration is not recited in claim 12. Accordingly, the Meltser et al. reference is still applicable to claim 12.

### ***Conclusion***

8. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, THIS ACTION IS MADE FINAL. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jonathan Crepeau whose telephone number is (571) 272-1299. The examiner can normally be reached Monday-Friday from 9:30 AM - 6:00 PM EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Randy Gulakowski, can be reached at (571) 272-1302. The phone number for the organization where this application or proceeding is assigned is (571) 272-1700. Documents may be faxed to the central fax server at (703) 872-9306.

Jonathan Crepeau  
Patent Examiner  
Art Unit 1746  
March 12, 2004

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